

*Claims*

What is claimed as invention is:

1. A superconducting cable comprising a plurality of individual superconducting wires that are stranded into wire bundles and ropes, wherein the individual wire bundles and the ropes are pressed together at their points of contact by a surrounding conduit that has been compressed to form a nearly rectangular shape.
2. The superconducting cable of claim 1, wherein each of the individual wires is capable of maintaining high densities of current when combined with other of said individual wires.
3. The superconducting cable of claim 1, wherein each of the individual superconducting wires is plated with a material of high electrical resistance.
4. The superconducting cable of claim 3, wherein the individual wires are plated with nickel.
5. The superconducting cable of claim 1, including a non-superconducting wire in each bundle of individual superconducting wires.
6. The superconducting cable of claim 1, wherein the bundles of wires are each a first stage cable and are twisted with a tight twist pitch of about 10 – 15 mm.
7. The superconducting cable of claim 6, wherein the ropes are ropes or bundles of the first stage cable and are twisted to form a second stage cable with a tight twist pitch of about 30 – 45 mm.
8. The superconducting cable of claim 7, including a plurality of said ropes twisted together to form a third stage cable with a tight twist pitch of about 100 – 120 mm.
9. The superconducting cable of claim 1, wherein each of the superconducting wires comprises a multiplicity of superconducting strands in a copper matrix.
10. The superconducting cable of claim 1, wherein the geometry for the superconducting cable provides at least a 50% void fraction for accommodation of a liquid coolant.
11. The superconducting cable of claim 1, wherein the superconducting cable contains at least three stages of sub-cables wherein the first stage includes copper-jacketed superconducting strands with a solid copper central strand, the second stage includes a number of first stage sub-cables surrounded by stainless steel foil with a spiral gap, and the third stage includes a number of second stage sub-cables surrounded by stainless steel foil.
12. A method of making a superconducting cable, comprising:

- a. providing a conduit tubing;
- b. forming a three stage rope of wires having a first stage including copper-jacketed superconducting strands with a solid copper central strand to form first stage sub-cables, a second stage including a plurality of first stage sub-cables surrounded by stainless steel foil with a spiral gap forming a second stage sub-cable, and the third stage including a plurality of second stage sub-cables surrounded by stainless steel foil;
- c. reducing the diameter of the conduit tubing to form a rectangular shape; and
- d. compressing the rope into the rectangular shape.